17

Lymphatics cont^d from 664 to 672

v the Urine, and mercury excites a
Salivation when applied in the form of
an ointment to the external surface
of the body. —

Observation not to think too highly of our ancestors in medicine, - to be ~~boun~~ modest and unassuming under our present attain=ments, and to look forward to posterity for discoveries in the animal Oeconomy more important & useful than even that of the Lymphatics. —

Of Secretions —

In considering this subject I shall 1st make a few remarks upon the Secretion in general; 2ly I shall consider the nature of each of the secreted liquors, & afterwards describe each of the excretions.

And here Gent: I feel disposed to make a pause. —— After contemplating the subject for many years, I confess I know but little more of it than I did the year after I began the study of Medicine. I shall however lay before you all the important facts that relate to it. and if I am not able to give you a just theory of it - Who knows but a

[I shall begin by assuming that the growth & support of the body is kept up by a process which ~~is to~~ might be called secretion – that is all the solids of the body have a power of assimilating the matters which nourish them, to their own nature, but our business at present is to ~~express~~ describe that kind of secretion only which goes forward in the Glands.]

single ~~[illegible]~~ thought ~~thrown~~ out in the course of this inquiry, may serve as a clue at a future day to guide some of you into a more successful investigation of the manner in which it is performed ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ I refer you to Anatomy for the names & definitions of the different species of glands. — They appear to be a very important part of the body, — hence we find they belong to the vascular — the lymphatic — and probably to the nervous system. It is common to add — to the venous system likewise for ~~the~~ Liver is supposed to be a venous gland. — [but I would ~~rather~~ rather suppose that this is not the case — and that the Liver is ~~an~~ ~~other~~ a large excretory duct, ~~instead~~ than of a true secretory gland]

as I shall say hereafter.

The structure of the glands was supposed formerly to be cellular, but the injections of Ruysch prove them to be vascular.

The liquors which are secreted are of a very different nature. – They are more viscid as mucus – & saliva – watery as the Urine – coagulated as Synovia & more thick, as Semen – Wax – and Fat.

~~supposed to be formed from the secretions of the Physiologists for it to be an excretion, but it is probable that the Urine both a secretion and an excretion. are therefore should be considered as a secretion.~~

All these liquors so various in their consistence, and uses, are formed originally from an apparently homogeneous fluid – viz: the blood.

In what manner is the question now before us. —

Various opinions have been proposed to account for the change of the blood into the secreted liquors, — such as the difference of diameter in the size of the arteries disposing them to admit particles of a certain figure, & to reject others, — but this hypothesis presupposes, that the matter of the secreted liquors preexists in a perfect state in the blood — which has not been demonstrated, by any of the advocates of the doctrine.

Another opinion — is that the blood is changed in the glands by means of a fermentation sui generis. To this it has been objected that, if this were the case, the quantity of a secreted liquor would

be encreased, when were there was an error loci of a secreted liquor as of Bile. or of the Urine — or if they acted as ferments, they would change all the fluids they met with in their course into fluids of the same nature with themselves. but this Objection has no force, for a vessel of a peculiar form may be necessary to produce this fermentation. The Analogy of the formation of variolous matter favours this Opinion. — a small portion of it multiplies itself from the assimilation of a fluid which certainly did not contain a single particle of original matter in it which resembled the small pox. It is remarkable further that this variolous matter like the original ferment of a secreted liquor, requires a peculiar

(I ~~see~~ mentioned something like this in Dr Prawl's esp.t – Dough fermented in the Stomach – &c)

place for it to reproduce itself. If swallowed with food, it produces no change in the salivary, or mucous liquors of the stomach, or bowels - any more - if injected into the blood, it does not change it into variolous matter, or produce any perceptible alteration in its qualities. - It is essential to its multiplication of itself - that it should be confined to the skin. -

The analogy of the formation of bitter & sweet fruits from the same water seems to favour this mode of the production of secreted liquors. - If

we are told that different degrees of action of the arteries & nerves whether produced by the emotions of the mind,

or by other causes, affect the secretions, rendering them thicker & thinner in some cases, and more or less abundant in others. - all this is true, - but is not fermentation greatly influenced by the circumstances of motion & rest as to the ~~quantities of~~ qualities - consistence, & quantity of the matters which are produced by it? -

When I speak of the production of new matter by fermentation, or by secretion - I wish to be understood to mean only, a new aggregation or arrangement of matters which had preexisted in some other form.

Leibnitz supposed that there were go to 681 ~~only~~ but five ~~primitive~~ original forms of matter,

VI Modern Chemists have gone further, and supposed that all the different forms of matter are produced by but two elementary substances viz: oxygen ~~[illegible]~~ metals.

V. It is a curious fact that the component matters in ~~[illegible]~~ certain poisonous & wholesome plants & also of other substances are the same in quantity - ~~[illegible]~~ as in the ~~[illegible]~~ Henbane and cabbage - also in the poison of the viper & gum arabic. The difference in their qualities seems to arise wholly from a difference in their arrangements.

& that the almost infinite Variety of substances which we see in the world were all produced by different combinations of these five original forms of matter. The amazing combinations which the original colors & tones are capable of receiving by Art, all of which appear in forms specifically different from each other, give some Color of probability to these Opinions of Leibnitz & the Chemists. The apparent transmutations of the bodies which Chemistry has taught us, and the particularly the late discoveries respecting the composition parts of Water, seem to add fresh weight to the

The action on wch the different secretions depend are of a precise nature, & the healthy quality of the secretions depends upon this being always the same. Sometimes this precise action is transferred from one part of the body to another in consequence of which the same results are obtained. Thus arteries secrete bile in blood vessels ~~&c in~~ Dr Well has lately proposed a new theory upon this subject. He supposes secretion to depend upon a certain precise action in the secretory vessels, and that the same liquors are secreted in other parts of the body where the same action takes place in them. Thus he supposes the yellowness of the skin in the yellow fever wch is transient & partial to be the effect of such a change in the capillary vessels as to cause them to resemble the action of the hepatic vessels. Dr Porter relates a case in the transactions of the College of Phys. in wch the stomach ~~where they~~ secreted bile, & ~~of the~~ ~~Shells here~~ ~~was taught that something like this takes place in the Diabetes. It takes place in the Vagina in Leucorrhœa~~

hence

hypothesis. — It is remarkable that the more opposite the Secretion, — the more unlike the liquor which is secreted is to the blood — as in the Semen, — & the less opposite the Secretion — the less unlike it is to the same of the liquors of the blood in Urine — as Mucus — Saliva — and the Lymph which is found in the cavities of the body. — The same thing takes place in fermentation. — Old wine is an illustration of the former species of Secretion. It scarcely shews any relationship to the fruit from whence it was obtained, while small beer partakes in its taste & qualities of all the ingredients from which it is formed. —

~~I have thus gone lightly over the Curtain only of this a difficult question,~~

Menstrual blood is now secreted by the Vagina instead of the Uterus during pregnancy. ~~It is analogous to a translated Issue.~~ We certainly see the same vessels perform very different actions, & very different results are obtained from them in many diseases. as Semen - Lymph - flughs - and black vomit from inflammation. ~~we see translated passes, & perhaps mind, also not translated functions.~~

~~I shall only add that the most wonderful operations in the body are called carried on by means of secretion.~~ Mr Dumas relates a case in which the lungs not only secreted bile, but also signified an appearance of Urine &

Perhaps the ~~[illegible]~~ presence of gravel in the stomach, as related by Dr Fenton, and of which the lungs of which I spoke in treating upon the Lymphatics, may have the effects of a secretion of the fresces the stomach, and of the latter in the lungs?

the whole Sum of which must sooner or later be laid open to us

The uses of the glands which contain secreted liquors are very great. They are like Closets in a well finished house, which contain different kinds of aliment for the tenants who occupy it. But the uses of the secreted liquors will appear more fully from taking a separate view of each of them.

They are Saliva - Gastric juice - Lymph - Bile, pancreat. juice - Synovia - Urine - Semen - Mucus - milk and fat.

I have hesitated for a while in admitting Urine among the secreted liquors - Its analogy with other excrementitious liquors which are discharged from the body without the

p: 681

The action or actions upon which the dif-
-ferent secretions depend are of a precise
nature, and the healthy quality of the secre-
-tions depends upon their always being the
same. Sometimes this precise action is
transferred from one part of the body to
another in consequence of which the
same results are obtained. Thus the ac-
-tions secrete bone when the blood vessels
become ossified, - and thus the vagina,
~~secretes blood~~ instead of the Uterus
secretes blood when the menses occur dur-
-ing pregnancy. Mr Dumas relates a
case in which the lungs not only secre-
-ted bile, but assumed an appearance re-
-sembling ~~the~~ the liver. ~~Perhaps the~~ and

Dr Gastally relates an instance of ~~milk being~~ ~~secreted~~ ~~by Dr Sutton~~ ~~secretion of milk in the stomach~~ ~~Dr Gastally~~ ~~may be the effects~~ ~~of the secretory~~ ~~made in the kidneys in the~~ ~~frequent use of the breast in the latter~~ ~~the secretion of milk being transferred from the breasts~~ ~~to the stomach~~ to the stomach & lungs.

It is certain different actions in the same vessels produce very different results. Thus in inflammation the same vessels, ~~secrete~~ according to the stage or grade of this action secrete serum, pus, ~~water~~ sloughs, water and the matter of the black vomit.

~~Do adhere to~~ To render ~~comprehend~~ this subject still more familiar to us, let us recollect what was said formerly of the tensio performing vicarious offices for

2

each other. I even supposed the medulla oblongata sometimes performed the office of the brain in exciting sensation, perception & ~~thought, &c~~ all the other operations of the mind. Why should not the glands, and all other parts of the body perform the same kind and neighbourly offices for each other? — For my part I see no difficulty in admitting this opinion, nor do I think it militates against the facts formerly mentioned of certain liquors such as urine bile and milk being absorbed by the lymphatics and deposited in the stomach and lungs. ~~Both perhaps are probably~~ vicarious secretions, and lymphatic

translations are probably both alike true.

I mentioned formerly the Sympathy between the eyes & salivary glands discovered by the ~~[illegible]~~ sudden increase of the secretion of saliva at the sight of food when the system is under the influence of hunger. Dr Jinks of Bucks County in this State informed me of an instance of Sympathy between the eyes and breasts. A woman who had separated herself from her child for one month in order to wean it, & in whom the breasts had become dry, had a sudden & plentiful exsudation of the secretion of milk as soon as she saw her child.

I have thus just lifted up the Curtain only of a difficult Question,

v mucilage - albumen - muriat of Soda, Phosphat of Soda, Phosphate of Lime - & Phosphate of Ammonia. 80 parts out of an 100 are composed of water.

It has a strong attraction for Oxygen, & retains so much of it that it will oxide O & Dif triturated in a mortar with it. It assists ~~the~~ oils in forming an oxid of mercury by trituration. It is the presence of ~~this~~ Oxygen in it that probably renders it some-times an useful application to Sores. Fasting Spittle.

It is much changed by disease - hence its smutish - salish - and bitter taste. When exposed to the air, it putrefies & emits a most offensive odor ~~[illegible]~~ & produces the same ~~[illegible]~~ ~~[illegible]~~ Alkalioid in it, that is produced by putrefaction. ~~[illegible]~~ The saliva thus affected by mercury ~~[illegible]~~ ? It once poisoned a cat in this state in the yellow fever.

aid of secretory organs would have led me to have connected it with them, - but the structure of the kidneys unfortunately forbad this natural arrangement. - They partake of the common properties of secretory glands.

1 Lymph - I spoke of the properties of Lymph when I treated of the lymphatics. - It is coagulable, but in a less degree than the coagulating Lymph of the blood. That which is found in the Ventricles of the brain and in the eye in this case is incapable of coagulation.

2 The Saliva yields by a Chemical analysis water - V 12 ℥ss - of Saliva are secreted in 24. It assists in promoting the dissolution of the Aliment in the stomach.

+ From disease it is probably like the blood, in a diseased state.

3

The Bile is formed in a peculiar manner. The liver in which it is formed receives its blood from a Vein, instead of an Artery. This blood from its slow & circuitous course is highly charged with hydrogen & Carbon, ~~which are its~~ ~~helps to form the Bile~~ and is otherwise better fitted to furnish the matter of Bile than Arterial blood. ~~By a chemical analysis the Bile yields~~ from p. 6 ~~96~~ Gum Albumen which is the cause of its viscidity, an Oil which is united to its colouring, or bitter principle - soda - phosphates ~~carbonates~~ - Carbonates - muriate of Soda - phosphate of lime - ammonia - & according to some an Oxyd of Iron, & ~~a~~ a small quantity of Lactacine - all united with a great quantity of water.

~~It is secreted the Bile~~ The ~~the~~ colouring & bitter principle which is separated from the Bile when it forms chyle, & ~~forms~~ afterwards ~~descends~~ becomes part of the fæces.

3 The gastric juice contains a considerable quantity of ~~the same~~ animal salt which yields a quantity of phos: acid. It has of late lost its strong dissolving powers formerly. It appears to possess this power in different degrees not only in different animals, but in the different periods of life in the human body. It is strongest in young people. It is influenced by diet. Thus persons who feed ~~as I suppose some men after~~ for a while on meat are unable to digest vegetables, and vice versa.

4 The pancreatic juice is supposed to be of the same nature as the saliva. — It ~~does~~ ~~are not fully agreed on~~. — ~~From~~ It seems to ~~be~~ act upon the hepatic ~~bile~~ ~~bile~~ or ~~chyle~~, in ~~a~~ properly speaking chyle in the same way that the saliva acts upon the aliment in promoting its change into homogeneous chyle. ~~ways to be explained when I come to treat on that digestion.~~

5 Mucus — is diffused thro every part of the body, — to obviate irritation — from the ~~[illegible]~~ friction of ~~to~~ solid

683

3 The gastric Juice contains a considerable quantity of an animal salt which yields a great deal of the phosphoric acid. I spoke formerly of ~~the~~ its strong dissolving power in treating upon Digestion. It possesses this power in different degrees in different Animals, and in different periods of human life. It is strongest in young & in old people. It is ~~[illegible]~~ changed in its qualities by diet. A diet of vegetables ~~[illegible]~~ disposes it to assume the same ~~[illegible]~~ qualities which it possesses in ~~[illegible]~~ herbivorous & granivorous Animals, while a diet of animal food imparts to it the qualities which it possesses in carnivorous Animals. I beg your Attention to this fact. I shall apply it in our Therapeutics.

4 The Pancreatic Juice is supposed to be of the same nature as the Saliva. It secrets act upon hepatic ~~bile~~ Chyle in the same way that the Saliva acts upon the Ali=ment in promoting its Change into Sto=machic Chyle. ——

5 Mucus is diffused thro every part of the body to obviate irritation from the friction of solid - p 684

V according to some Chemists no less than 11 different matters dissolved in water [These are ~~the~~ Urea [so called by Fourcroy which is a syrup like, crystalizable & delaqueacent matter, to which the Urine owes its particular Odor, color & taste, ~~[illegible]~~ and ch. w. consists chiefly of Azote) & a gelatinous Animal liquor] Muriates & phosphates of Soda, & ammonia - hypesate, or United in a simple Salt, - phosphate of lime, - phosphate of magnesia, - phosphoric, - Uric, & Benzoic Acids. The Urea combined with a certain quantity of Oxygen is said to form the greatest number of Calculi, but many of them are formed, of different proportions of all the different matters which enter into the composition of the Urine, hence the impracticability of discovering a solvent for Calculi in the bladder whether conveyed into the body by the Mouth, or injected thro' the Urethra into the bladder.]

Urine has been divided into 3 kinds.

bodies, as well as the irritation which is created in tender parts by acrid liquids & very Air. - Hence we find it in the nose Oesophagus - the stomach - bowels - Urethra Vagina - and trachea. That in the nose Absorbs & abounds in oxygen.]

6 The Synovial fluid is secreted chiefly during the night. It is interposed between bones which move on each other. The Waste of this liquor in the course of a single day is evident by persons measuring half an inch in height less every night, than they measured in the morning. It contains fibrous matter - Albumen - muriat of Soda - Soda - phosphate of lime & water.

7 The Urine contains a large quantity of urinous Salt - with some earth, & this earth is said to be a calcarious nature, & contains a finely attenuated oil

1 Watery from large quantities of drink 2 Chylous from a mixture of Chyle a few hours after eating & 3 Urinary from the blood. such as is discharged after ~~eating~~ a slow & operose secretion in the morning. ~~The & is often discharged so suddenly~~ = p 683

go to opposite page of p: 686 ‡

[V ~~Bat~~ This is explained by Dr Darwin upon the principle of retrograde action - But I would rather suppose it was occasioned by a temporary translation of the Urinary power of Secretion, to the Stomach. ~~This~~ Instances of translation of secretions from one part of the body to another ~~is~~ were mentioned in treating of Secretion. ~~not uncommon~~ An example in Diabetes.] -

[The Glands performing double duty in the absence or suspension of the functions of any one of them. 2g: ~~Urine & Dropsies~~ Hence follow obstruction of liver in Dysentery.]

a portion of Acid mixed with it. [of the] more ~~hereafter~~ after when we come to treat of the generation of the calculus. This secretion is influenced by many circumstances. Heat lessens it & Cold increases it. ~~Drinking liquors increases it & Cold decreases it~~ as to create a ~~deposition~~ belief that there is a passage which conveys them directly from the Stomach to the kidneys & bladder. This is certain that not only Urine, but even ~~even~~ Urinary gravel have been discharged by from [illegible] Vomiting. A case of this kind [illegible] been communicated ~~to the College~~ to the world by Physicians of Philad. in a letter from Dr. Senter of Ireland. V But further the exercises of the Understanding, and of the passions ~~off~~ affect the

The sudden & wonderful increase of Urine, can be accounted for only, by admitting the passage of ~~retrograde motion of the~~ Lymphe ~~lines~~, by means of ~~by~~ absorption ~~& with Urinary~~ into the ~~bladder~~ urinary organs without ~~pas~~ mixing with the Circulation.

✓ It is the heaviest of all the secreted liquors. By distillation it yields phlegm, a Vol: Salt - a fœtid oil & a large quantity of earth. —

The Urine of Children is more bland that that of Adults. It contains but little of the phosphate of lime - owing to the demands of their little bones for it - In old men the Urine, is acrid, & abounds with phosphate of lime, from their bones having no more demands for it.

The Urine of Carnivorous Animals is more acrid, fœtid, & smaller in quantity than the Urine of Granivorous & herbivorous Animals. — Diseases of the

quantity of the Urine. Studious people are frequently obliged to rise often to make water, and you will find. ~~I shall [illegible] not~~ some remarkable cases of an immense discharge of water from the influence of fear in my essays. ~~+~~ The semen has a disagreeable smell, according to Mr Hunter and a pungent taste. ~~+~~ The notion of its being discharged from the testicles instead of the seminal vesicles in coition as taught by Mr Hunter is altogether hypothetical. ~~+~~ It is supposed to be absorbed in puberty, and to produce by its action on the system those changes which take place in the body at that period of life. But I doubt the truth of this opinion. Girls undergo nearly similar changes in their systems at the same time of life without the

kidneys are more common in cold, than warm climates - owing to the great labor which the kidneys undergo from the frequent diminution of perspiration by cold & moisture, which weakens them & thus predisposes them to disease. kidneys alternate in their action with the skin in cold weather in middle latitudes also. In summer with - the bowels & lungs.

By a chemical analysis it yields (a) 6 parts of animal mucilage 3 of phosphate of lime - 1 of soda - & $\frac{90}{100}$ of water. It is the soda which changes the syrup of violets to a green color. The fecundating quality of the semen is said to depend chiefly upon its animal mucilage, or as it might be called gelatinous mucus. - It contains a number of animal salts in common with many other animal fluids & the juices of some plants. Its fecundating faculty was once supposed to depend upon them, but Spalanzani has overthrown this hypothesis by experiments c.

agency of any such cause. Perhaps it would be more just to ascribe the semen to the previous changes in the system, than the changes in the system to the absorption of the semen. — V

The semen becomes thick by stagnation like many other liquors from the absorption of its watery parts by the lymphatics. — In intemperate venery & after the practice of the foul & detestable vice of Onanism — it becomes thin & watery. I have heard of a case in which blood was discharged by that vice instead of semen. In old men there is reason to believe that the semen partakes of the acid quality of all their juices. In old age I have

From the rapid manner in which Urine is discharged after large quantities have been taken into the stomach, ~~it~~ from its pale color and from the passage of the Colouring ~~matter~~ ~~of~~ matter into the bladder after a ligature had been made upon the Thoracic Duct, ~~its~~ formerly mentioned, it has been supposed there is an unknown duct which leads directly to the kidneys or bladder ~~from~~ the stomach. That duct was said to have been discovered some years ago by Mr Hunne, but subsequent experiments led him to renounce his supposed discovery. I ~~do not~~ will not say such a duct does not exist, but many facts induce me to believe it to be unnecessary, and that the rapid passage of water, and other liquids from the stomach to the

bladder may be explained without it.
I shall briefly mention those facts.
1 A sudden and profuse discharge of
Urine is sometimes induced ~~by causes which~~
~~do not act upon the stom~~ when the stomach
~~does~~ not contain any water in it,
1 by a paroxysm of Hysteria.
2 by great exercises of the Understanding.
Where is the Student that has been engaged
in ~~a difficult~~ investigating a difficult
Subject that ~~to~~ has not been compelled to rise
from his Seat two or three times in the
Course of an hour or two in order to
discharge the contents of his bladder?
3 A sudden paroxysm of fear generally
produces ~~a~~ copious & frequent discharges
of Urine.

4 a profuse discharge of Urine is often a premonitory sign of the plague & of the yellow fever. This sign as mentioned in the history of the plagree at Basora, and I have observed several instances of it in the American yellow fever. A similar profuse discharge of Urine sometimes takes place in the yellow fever in its last stage. These facts being premised I proceed to remark that in explaining the reason why a large quantity of Water in the stomach so suddenly excites a copious discharge of Urine, it will be necessary to recollect two things that were mentioned formerly, 1st That the whole Lymphatic System is a Unit, and that all its

parts possess a quick and extensive Sym=
=pathy with each other, & 2ly that the Sto=
=mach as the representive body of all the
Systems, is in a peculiar manner the
Centre of the Lymphatic System, and that
a powerful impression upon it by the Sti=
=mulus of distention, sets every part of it
in motion, and disposes it to throw its
redundant contents out of the body, in order
to make room for the fluids that have
been taken into the stomach. The bladder
in this case is to the Lymphatics, what
the Spleen is to the blood vessels, it is their Waste
gate, and hence it is generally the receptable
~~of~~ and Outlet of the ~~all the~~ redundant fluids ~~beyond~~ from
the body. I say generally, for they are
~~sto~~ sometimes discharged in sweat by the

p 687

(a) ~~The~~ We are prompted to discharge the Urine by the irritation it excites upon the neck of the bladder, or by the stimulus of distention from its fulness. The Sensation in both cases is a local disease — happily created, induced by to prevent the Gravel & Stone by the stagnation of the Urine, as also many other distressing evils.

go to Secretion of Urine 2d.

pores, and, when this is not the case, they are poured into the cavities of the body where they create the different forms of Dropsy. It is remarkable the discharge of ~~to~~ a watery fluid ~~is sudden~~ from the pores is sometimes as sudden, ~~to~~ after filling the stomach with cold water or any other cold liquor, as it forces the bladder. ~~who has not felt it~~ This profuse ~~but~~ discharge from the pores takes place in some instances before the cup of cold liquor is taken from the mouth, – and yet who upon this account can suppose that direct ~~a~~ passages ~~to~~ exist from the stomach to every pore in ~~part of~~ the body? – It can be explained only by ~~allowing~~ the ~~Electrical by~~ unity of the Lymphatic ~~Lymphatic~~ System, and ~~to~~ the electrical sympathy

(if I may be allowed the ~~expression~~ allusion) of all its parts with each other. —

It is because we have ~~too~~ so constantly been in the habit of confining Unity and Sympathy exclusively to the nervous System, that so many of the phenomena of the other Systems appear mysterious to us, or are ascribed to erroneous causes. Recollect Gent: I said in treating upon the nervous System, that the blood vessels, Alimentary Canal, the Skin and the Lymphatics all possess a peculiar & specific Sympathy as far as it relates to motion, independantly of the nerves, and that it was as mechanical from the Continuity of Similar matter, as the Sympathy of the extremities of the mast of a Ship, or of all the parts of ~~the~~ a bell with each other.

To the Solution of the cause of the rapid passage of water from the Stomach

I told further, that other liquors such as broth, malt liquors, the liquor of the loco Weed all pass from the stomach into the bladder without undergoing any change in their qualities. I admit these and many similar facts, and ascribe them to the same ~~cap~~ voracious=ness in the dym=phatics which dispose them to ~~take~~ devour and convey out of the system pus, bone, and feces in an undigested state thro' the same emunctory. The kidneys in these cases are so relaxed as to ~~pass~~ permit those liquors to pass thro' them without under=going any change. They resemble in this change the liver which when diseased per=mits water and blood to pass thro' it into the bowels.

4 to the bladder ~~to~~ which I have given, it may be objected,

1 That the liquor discharged in these cases is unchanged in its qualities, ~~and particularly that when water has been taken into the stomach~~ and that the Urine has the paleness & taste of simple waters when water has been taken into the stomach; and so it has when discharged in a paroxysm of Hysteria, and of fear, and after intense study in none of which cases has it ever been supposed to come from the stomach. But we are

2 In the Transactions of the College of Physicians ~~that is~~ of Philadelphia, I said formerly there is an account by the late Dr Senter of Rhode Island ~~that~~ of a person who ~~discharged~~ laboured under a suppression of Urine, that discharged both Urine and gravel by puking.

In this case both the Urine & gravel it has been said must have come by a Direct passage from the bladder to the stomach. To this I shall reply by recalling your attention to the facts that were mentioned a ~~what was said a~~ little while ago of the secretion of bile and milk in the lungs. ~~and of bile an~~ I see no difficulty in supposing that the vessels of the ~~lungs~~ stomach assumed the same specific action as the vessels of the kidneys, and that they secreted the Urine ~~and~~ from which the gravel ~~the~~ was deposited that were puked up by Dr Senter's patient.

3 ~~Lastly~~ Mr Horne's argument in favor of a passage from the stomach to the kidneys from the colouring matter of Rhubarb passing into the Urine after tying up the thoracic duct of a rabbit, has already been ~~disposed~~ objected to. I have ascribed it to the colouring matter of the Rhubarb ~~penetrating~~ passing into the stomach and passing by means of the blood vessels directly to the kidneys.

V The Tears are watery - colourless & of a saline taste. They tinge ~~[illegible]~~ leaves of the violet of a green color. In old age their saline quality is encreased - hence they often inflame the Cheeks. They yield by a chemical analysis - water - mucilage, muriat of Soda - Soda - Phosphate of Lime & Phosphat of Soda.

been informed there is often a pain felt in the Urethra after the emission of Semen in a venereal connection — probably from an increased acrimony in the Semen. —

The liquor of the prostate gland partakes of the nature of Mucus. — It is always mixed with the Semen in its emission, but for what purpose has not been agreed upon by Physiologists. — May it not be to cover the natural acrimony of the Semen during its passage thro' the Urethra — and perhaps into the Vagina afterwards? —

9th The Milk is a secreted liquor obtained by a process very simple, and from a part of the blood which has undergone only a small part of the sanguiferous

process — viz the Chyle. It would seem from this and many similar facts that fluids of a very different nature may float in the blood & lymphatics without mixing with it. [The discharge of Urine by vomiting & perspiration] ~~and~~ The discharge of bony matter by Urine formerly mentioned, ~~also~~ & of pus, — by all the emunctories, clearly demonstrate that this is the case. — Nor should we wonder at it — for no more takes place here — that what we observe every day in the relation of chemical bodies to each other. —

~~Chyle~~ The milk ~~an~~ seems to be a secretion from the fresh Chyle. It partakes of several of the properties of Chyle. It is probably to Chyle what

common
Lymph is to the coagulating lymph,
or the Urine - to the Serum of the blood.

~~[illegible]~~.

That it is a secretion from the Chyle I infer from the immense quantity of it which is ~~[illegible]~~ frequently found in a short time - Eg: LX ℔i in 24 hours in a Cow. That it obtained from the Chyle, I infer further from some Ex=periments made by Dr. Percivall who obtained a large quantity of Chyle by tapping a person who had an ascites from an rupture of a lacteal vessel. The liquor yielded an acid, & exhibited all the other properties of milk. All the other secreted liquors, yield a volatile alkali in common with the blood from which they are obtained. —

V a whole family of Chester town drank the milk of a Cow the day she sickened from the bite of a mad dog, but no one of them was affected. I have heard of two similar cases one in Jebez Eyre's family. But I have heard of a whole litter of pigs nine in number being killed by sucking a bitten Cow – perhaps only from Commotions excited in their Systems by a febrile State of the milk.

Milk is composed of three parts - viz: Oil - mucilage - & water. The Oil and water are united by means of the mucilage, so that milk may be called an animal emulsion. - The Oil yields - Butter - the mucilage Cheese - and the water is what is commonly known by the name of whey. - The Oil & whey are of a vegetable - the mucilage of an animal nature.

The whey is of a saccharine quality. ~~Extract~~ ~~& Zix of the whey~~ yielded in an experiment 64 grains of pure sugar. If all substances are nourishing according to the quantity of ~~sugar & oil~~ & mucilage they contain, it is no wonder that milk affords so much nourishment.

The secretion of milk is much affected by passions of the mind. Children are

V turn back to V p 64 / The first remark I shall make upon the Secretions is that the most impor=tant functions of the body are carried on by them. Besides those which have been mentioned, it would seem that the product of animal heat is a Secretion of Calorie from the Air — and even that the formation of sensations from impressions — of perceptions from sensations — of ideas from sensations, and of thoughts from ideas — and even of the fœtus from the semen masculum & an ovum are all the results of a process analogous to Secretion for all those results are as dissimilar from the causes which produce them as Bile, Saliva, Gastric Juice are from the blood out of which they are formed. In short — the

VI ~~I cannot dismiss the history of the Secretions without taking notice~~

Often convulsed from sucking an angry nurse or mother — But strange it is to add — that the milk ~~of~~ is seldom the vehicle of any disease to a child. While the lips — tongue & mouth of a child are sound — it often sucks the breast of an nurse or mother infected with the venereal disease, without receiving ~~the disease~~ that disease. ✓

~~of that & more a section than sending~~

In the Philos: transactions there is an Acc^t of a Physician who ~~[illegible]~~ declared from the Authority of his parents that he had sucked his mother while she was ill with the plague without receiving the disorder from her. Where Children were infected with the plague by their mothers they probably receive it only from the breath — of the breath will infect before ~~the hysteria~~ disease is felt in the system.

a whole family in Chester town some
years ago drank the milk of a Cow on the
day she sickened from the bite of a mad
dog, but no one of them was diseased by
it. I have ~~been~~ heard of two similar
instances of the innocuous quality of
the milk of cows ~~while~~ while they were
affected with the hydrophobic fever.
In reply to these facts I have been told
a whole litter of pigs nine in number
were killed by sucking ~~[illegible]~~ their dam while
under the influence of this disease. The
mortality in this case I suspect was
brought on by the commotions ex-
-cited in this system by the febrile

V wine has been discovered in the
milk after being taken by nurses.
No wonder the milk should induce
convulsions & death. —

state of the milk. I have known convulsions & some
from children. Sucking an angry
and drunken nurse. The ~~milk~~
qualities of the milk in this case are
alterated by the rapidity of the secretion
which is created by the anger or by
the strong drink. Lancisi tells us that

Taken ~~the~~ a review of the functions
it appears that the most important
functions of the body are carried on
by them. Besides those which have
been mentioned, there are I have no
doubt many others. It is probable Ani-
=mal heat is a nothing but a function
of calorie from the air in respiration
=ent parts of the body and from diffi-
and all the other forms by pressure collision
of stimulus.

The formation of the fœtus in Utero has been supposed in like manner to be secreted excited by the stimulus of the semen masculinum upon the female Ovum. In short every part of the body is repaired by a secretory process – that is the part to be repaired, assimilates the matter brought to it by a secretory process to its own nature. But some writers have gone further & said that sensations are secreted from impressions – and hence their great dissimilarity mentioned formerly – that perceptions are secreted from sensations, – ideas from perceptions and thoughts from ideas. This opinion is fanciful, and without foundation. As well might we ~~say~~ say the impression upon wax is ~~the~~ a secretion from the seal, and

that ~~the~~ sound ~~is a secretion~~ which issues from a bell when struck with a hammer is a secretion from it.

I have only to add to this subject that there can be no secretion in any part of the body without the presence of nerves. —

a

a

692.

Of Fat

This substance is found in small cavities which have no communication with each other, and which are absorbed with the fat in ~~the~~ sickness, and in famine. ~~It is~~ It is the product of a secretory process. ~~[illegible]~~ It is most liquid in the hollow parts of the body, and ~~[illegible]~~ melts by exercise, - hence it is seldom found in the hands and feet which are more prepared by exercise or labor than any other parts of the body. It abounds most in the omentum, in the intervals between the muscles, ~~in the [illegible]~~ more especially of the muscles of the face in the mammæ, and in the orbits of the eyes. ~~[illegible]~~ Its uses are

1 To facilitate the motion of the body.

2 To fill up certain cavities in the muscles and particularly ~~of~~ the face & thereby to add to the beauty of the body. ~~That~~ this is the case we infer from persons ~~being~~ acquiring and losing beauty by the increase or diminution of fat in their faces according as that fat adds to, or detracts from ~~the~~ what Hogarth has very properly called the line of beauty.

3 To protect the body from cold, being a slower conductor of heat than flesh. Sailors know the truth of this remark, and hence they sometimes cover their hands with grease in very cold weather.

4 It is said by the chemists to furnish the body with Hydrogen & Carbon which dispose it to absorb more oxygen

V 3 [Women have generally more fat than men from their leading more sedentary lives. To the fat in their faces they owe their having generally more beauty than men.

That is ~~rare~~ nearly universal in infants and children before they walk, owing to ~~their incapacity~~ the nourishment greatly of their food, and to their inability to use exercise.

That is ~~rare~~ rarely to be seen in sailors & soldiers, ~~on fatigues~~, owing to constant labor and solicitude of their lives. It is likewise a rare disease among our Indians from their scanty aliment, and hardy manner of living]

from the air, and from our Aliments. ~~The~~ The fat they say is rendered hard by its Union with Oxygen. What makes this probable is, Oils are hardened by it out of the body, and hence they are called Oxyds.

5 The fat ~~serves~~ serves to afford nourishment to the body in the absence of ~~food~~ appetite, in sickness, and in situations in which Aliment cannot be obtained. The omentum I have supposed is the principal resource of the System for that purpose. I have said fat is melted by exercise & labor. This is most obvious in horses ~~when~~ after ~~undergo~~ hard running. It is found in these cases in their bellies and discharged in their stools. - It is also found ~~in these cases~~ in their blood when it is called by the

V Twenty eight pounds of fat yielded by Distillation according to Mr Creil ℥20 ℥v and 40 grains of a ~~fluid acid phlegm~~ fluid acid, ℥33, ℥iij and 30 grains of ~~Charcoal~~ an acid phlegm, ℥iij ℥i and 40 grains of Charcoal. Five drams & 10 grs were lost by the process of distillation.

fairness, Inotten grease. V

I shall hereafter consider ~~fat as~~ an undue quantity of fat as the effect of a disease, and enumerate all its causes. At present I shall only take notice of ~~two or three~~ a few facts connected with it.

1 When it takes place in early life, it is generally attended with other diseases, ~~and often~~ or predisposes to them, - and hence premature obesity is seldom attended with long life. It is less disposed to shorten life when it occurs after 40 years of age.

2 Fat oxen and fat animals discharge less blood than such as are lean under equal circumstances. This has often been ascertained ~~by the~~ by butchers, poul=-ters and latterly by physicians. Two causes concur to produce this, ~~diminution~~

v 3 Women have generally more fat than men from the greater laxity of their blood vessels, and from their leading more sedentary lives. To the proper distribution of fat in their faces, they owe their greater beauty than men.

Fat is nearly universal in infants, and children before they walk, owing to the nourishing quality of their food, and to their inability to use exercise.

Fat is rarely to be seen in Sailors or Soldiers, owing to ~~their~~ the constant labor and solicitude of their lives. It is likewise a rare disease among our Indians, owing to their scanty aliment, and hardy manner of living.

1 ~~Where~~ Where fat comes on suddenly before blood-vessels are formed to convey blood to it, there is a less quantity of blood in the body, than in a lean person of equal weight. and

2 where the blood vessels & blood are increased in the ratio of the fat, the blood vessels are so prepared by the fat that they are unable to discharge it in the same quantity as they do in lean persons of the same weight.

~~By fat is a disease, and as disease is always~~

I shall say hereafter that all the causes of fat act by inducing ~~a~~ by general debility. This debility produces relaxation in the muscles or flesh. ~~of all Domestic Animals. This~~ when it occurs in Domestic Animals it renders their flesh tender, and easy of digestion — hence the lean of fat sweat is always more easily

digested than the flesh of lean animals of the same age. Fat ~~wear~~ renders the flesh of old animals tender & easy of di=
=gestion — hence the planters in Jamaica after working their Oxen till they have lost their teeth by age, fatten them with boiled Sweet potatoes, and thus render their flesh as tender & pleasant as the flesh of young animals. —

waste of every part of the body is repaired by a secretory process - that is the wasted part assimilates the matter which is brought to it to its own nature.

~~Of the Faces~~

V Alexander the great used to say after being satiated with human glory, ~~to~~ that were it not for his passion for ~~the fair~~ women he should believe himself to be a God. He might with more propriety have considered himself as a mere man, had he recollected for a moment that ~~like~~ ~~other man~~ he ~~was~~ held his life by the ~~loathsome~~ humiliating tenure of ~~being the forming~~ being obliged to ~~in it~~ discharge ~~day~~ from his bowels ~~that~~ ~~loathsome~~ every day in common with other men, that loathsome mass of matter we call Faces.

Of the Excretions.

~~These~~ In the excretions I include ~~the~~ Fæces - Bile - and perspiration. To these some add Sweat - but this is only a preternatural discharge of the insensible perspiration. —

~~Of the Fæces~~

I before mentioned that they ~~were~~ were precipitated from the ~~chyme~~ Chyme in the Duodenum by the effusion of the Bile - from which they derive their color. They afterwards ~~from the~~ pass into the lower bowels, putrifying in their way. They excite to a discharge by their weight or by the stimulus ~~of~~ of their acrimony, preying upon the Sphincter Ani. - The pain thus excited ~~by the acrid~~ contain a large quantity of Sulphurated Hydrogen which is said to be inflammable. It is this hydrogen ~~which~~ which sometimes tinges ~~the~~ waters of a dark color when diluted they have the syr. of V. green.

To the Septic parts of the blood, the Lymphatics add their impurities absorbed from the faces and probably from all the decaying parts of the body. It is no Objection to this Theory first suggested by Dr McClurg, that the ~~bl~~ Venous blood when collected in the liver putrefies slower than blood taken from other parts of the body. I shall say presently that it acquires antiseptic quality & for wise purposes in passing into bile. Thus Nitre - a powerful antiseptic is the product of putrefaction. Thus too the serum of Scorbutic blood is a powerful Antiseptic.

~~a further div of the use of~~ 694 go to p: 697

~~Forming div of the~~ Bile I refer you to the lecture on the functions of the liver. ~~Go to p 697~~

I have ~~carefully~~ for many years considered the Bile in part as an Excretion. I was led to adopt this opinion by reading Dr M Lurg's learned & ingenious experiments on the Bile. He supposes that the blood has a septic tendency at all times - that its septic parts ~~are absorbed and together with the putrid septic parts of the faeces & that~~ they are conveyed to the Liver where after undergoing a short process they are converted into bile. This process which scarcely deserves to be called a Section - being performed by means of a large vein only. This opinion of Dr McLurg's is supported by the increase of the quantity & activity of Bile in hot weather, & in ~~certain~~ those bilious fevers in which there is ~~the always~~ the greatest tendency in

It occurs in the Gout, & even in strong emotions of the mind. It occurs from the increase of the circulation from exercise — hence the bitter taste in the mouth in the morning after a day of fatigue.

2. But I consider its ~~still~~ properties as an Excretion to predominate over its ~~properties~~ properties as a secretion. In the Scuttle fish the Bile is discharged near the Anus. Here it performs none of the offices of a secretion. — It is this dark liquor which the Scuttle fish discharges when it ~~wis~~ eludes the pursuits of an enemy.

I said — that ~~the pancreatic~~ it was not determined what purpose the pancreatic juice served when mixed with the Bile. May it not be to dilute & thus blunt its acrimony when it has absorbed too much ~~septic~~ acid matter from the blood & fauces?

from violent action
the fluids to putrefaction. +

The bitterness of the Bile proves likewise its ~~having put on~~ being the product of a septic process. — We find a taste exactly like it in a rotten or putrefied ~~apple~~ apple. ~~which has undergone~~ ~~this rotten~~

But Dr McLung's discoveries do not stop here. He supposes the bile when formed, to act as an antiseptic upon the fluids with which it is mixed in the alimentary canal — and hence it is exposed in the greatest quantities in hot weather.

~~than diseases when we are most liable to putrid diseases.~~ — In performing this office, the bile partakes of the nature of a Sanitive.

~~This wonderful transmutation of a matter, the offspring of putrefaction into a medicine to obviate putrefaction,~~

has many analogies both in the natural & moral world. Thus Ochre the product of putrefying animal & vegetable matter preserves great from putrefaction & the green mopy substance which is ~~one~~ ~~Phenomenon~~ by stagnating water, in summer is a vegetable, which yields pure dephlogisticated air, which corrects and destroys the impure miasmata of the stagnating water. In the moral world analogies of evil curing evil are too numerous to be mentioned. —

However simple this theory may be, I confess I have admired it more than many of the more striking phe=nomena of the animal Oeconomy. In contemplating the Liver, I have learned

v The peristaltic motion of the bowels is ~~kept~~ assisted by the stimulus of the Bile — hence we find Costiveness to follow the ~~destruction~~ suppression of its discharge in the Jaundice.

[The Other diseases of the Bile will form an important part of our pathology.]

It Discovers not only a yellow — but a green & ~~black~~ yellow color in the blood. — hence the yellow, green & black color observable in y Skin.

to compare it to a manufactory of Sal Ammoniac, in which the ~~putrid~~ hoofs & horns & other putrid ~~[illegible]~~ Offals of animals are collected, and changed by means of certain chemical processes, into a beautiful medicinal salt. ~~The [illegible] formation~~ Nature exceeds ~~of the bile differs~~ Art in ~~her~~ forming her antiseptic Matter, without an offensive smell.

~~Ho~~ How wisely ~~contrived is every~~ are all the functions ~~part~~ of the human body administred! & how many lessons may be learned from ~~it~~ them of the most ingenious & profitable Oeconomy!

Cystic Of the Bile

The natural color of the Bile is yellow. It sometimes acquires a green color by its mixture with an acid in the alimentary canal. It becomes black in malignant bil: fevers. The passions of the mind have

V people are disordered only from the indulgence of angry passions. It is one of the waste gates of excess impressions.

The strength of the system (so necessary to second the passion of Anger) is increased by the stimulus of the Bile on the Alimentary Canal.

Hydrogene gas, ~~commonly called marsh miasmata~~ acts specifically upon the Liver. ~~This was formerly proved~~. I shall say hereafter that intemperate people are subject to a morbid ~~secretion~~ excretion of Bile. May not this be owing to the Hydrogene contained in ardent spirits acting in like manner upon the Liver? This idea was first suggested to me by Mr. Cooper of the hospital. Dr Darwin

a great effect upon the excretion of Bile, particularly Anger. Hence an angry is often called a choleric man. I knew a young man in this city so much irritated by an insult ~~from~~ in a friend's house which he could not decently resent, that he retired into an alley, and relieved ~~him~~ his feelings by discharging a gill of bile from his stomach ~~[illegible]~~ the livers of mad dogs.

The Bile yields by chemical analysis a large quantity of oil, some water & an alkaline salt. Its saponaceous quality is altogether hypothetical.

go back to p. 683

Fat ~~[illegible]~~ is secreted from the blood. ~~and~~ Its solidity is owing to its being combined ~~[illegible]~~ as hereafter with Oxygen. This gas we know renders Oils solid out of the body. Hence they are called Oxyds. It is a corpse de reserve to the system, serving to nourish it in sickness. It serves likewise many uses in the body. It defends from cold, & when moderate, renders the body more beautiful.

speaks often of the connection of Gout & diseases in the Liver — and ~~ascribes~~ derives the former from the latter. It is much more natural to derive the diseases of the lives from the same causes which induce Gout, particularly the intemperate use of ardent, and fermented liquors.

Marsh miasmata affect the Liver specifically. Hence the morbid state of that viscus in all autumnal bilious fevers, & hence the morbid phenomena which are exhibited by the lives of cattle hogs, sheep, & even poultry in the fall of the year in a sickly season. —

V. says he collected 30 grains of ~~this~~ this water from his Arm in the course of an hour. In this exp^t there was a fallacy as I shall say presently.

# of Perspiration

The first Question that occurs upon this subject, is - ~~that is one~~ the how do we know that any matter of any kind is discharged by the skin, since it is not perceptible by our senses.? I answer by first washing the Arm, and then holding it for sometime in a long cylindrical glass vessel. The vessel soon becomes dim, and if the Arm be held long enough in it, small drops of water will be seen fall to the bottom of it. Mr Cavendish

~~I proceed~~ But further, ~~that certain~~ by means of certain glasses this perspirable matter may be seen issuing

of the Cystic Bile.

The natural color of the bile is yellow. It sometimes a green color by its mixture with an acid in the alimentary canal. It becomes black in malignant fevers. when it is absorbed, it ~~sometimes~~ imparts ~~not~~ only a yellow, but sometimes a green and even a black color to the blood and the skin. ~~wh~~ the black jaundice as it is called is occasioned by the absorption of black bile.

I said formerly that the cystic bile by its stimulus upon the bowels prevented costiveness. It likewise imparts strength to the whole system by its stimulus upon the alim^y canal. Its quantity is greatly increased by the passion of anger. The livers of mad people are disordered in consequence of the

indulgence of their angry passions, — the liver ~~being~~ is one of the waste gates of escaping impressions upon the mind.

The bile yields by a Chemical Analysis some albumen which is the cause of its viscidity, an oil which is united to its colouring or bitter principle, Soda, phosphates - Carbonates - muriate of Soda, - phosphate of lime, ammonia, & according to some Authors an oxyd of Iron, & a small quantity of Saccharine matter - all of which are united with a small quantity of water.

The colouring and bitter principle ~~which~~ is separated from the bile, when it mixed with the Chyle, and afterwards becomes part of the faeces. —

~~to be capable by means of preserve of admitting the different kinds of Ayr into the body. Dr Abernethy.~~

Dr Haller says he once saw it discharged from the face and fingers in a Cave, and Winslow says he saw it ascending from the naked head of a man. It is seen with the naked eye issuing from the lungs in cold weather.

from the body, and with a force y. 4 carries it 3 or four inches in a strait line from the vessels in which discharge it. 5 ~~[illegible]~~

The 2d Question is, - is the perspirable matter a secretion, or is it a simple discharge from the extremities of the Arteries.[2]

Upon this subject there are two opinions. ~~[illegible]~~ The opinion of its being a secretion ~~is actually based [illegible]~~ was ~~first~~ held by Malpighi, but has been opposed by several experiments made by Ruysch & Haw Boerhaave. The latter injected the (previously softened by warm water) arm of a dead body thro the Axillary Artery, & distinctly saw ~~[illegible]~~

[V. Carbonic acid gas. whether this gas be emitted from the pores, or formed after it is discharged by the union of Carbon, with the oxygen gas of the air, ~~has not been~~ is uncertain, but it possesses like the carbonic acid gas the property of extinguishing flame.]

V Dr Klapp's experiments upon it which he ~~has~~ kindly put into my hands, prove that this salt in the healthy state is neither an acid, nor alkali. He proved further ~~that~~ by experiment that it contained no ~~of~~ astringent matter in it. Perhaps its saline taste may be owing to its partaking of a morbid quality from the ~~[illegible]~~ of heat or acrid?

~~of Dressing~~ it discharged in ~~[illegible]~~ drops thro' the pores of the skin a con-
-trary opinion ~~probable~~ from ~~[illegible]~~ weights in
3 What is the nature of this perspira-
-ble matter? — I answer that it con-
-sists ~~[illegible]~~ 1st of water. This is
obvious from the experiment made
with the Cylindrical Glass formerly
mentioned. 2 Salt ~~[illegible]~~ This salt is said to be phosphoric,
also the phosphate of lime & tree. It is
~~[illegible]~~ is some-
-times perceived on the back of the
hands, & often perceived on linen
that has has been worn for some
time. ~~[illegible]~~ 3 ~~[illegible]~~ ~~[illegible]~~
~~[illegible]~~ ~~[illegible]~~ from its fairness
with the matter which is discharged
from the lungs, ~~but from~~ certain actual

~~But this is not all — the arm held for sometime in a glass of lime water rendr it turbid — in the same manner as the Mephitic ~~or carbonic~~ gas does. It also ~~is~~ extings the blaze of a candle. It is foul gas when confined under linnen for two or three weeks that produces the Jail, Ships, or hospital fever.~~

V and contaminates the air much more than in persons who do not work. It has been proved that six watchmakers do not ~~any~~ corrupt the air ~~[illegible]~~ so soon as two carpenters under equal circumstances of room, time, and ~~[illegible]~~ labor.

~~In Italy it is $\frac{5}{8}$ of what is taken into the body. in England Dr Keil says 33 ounces in a day.~~

experiments. A blazing candle introduced under bed cloaths near the person in a smothering - suddenly extinguishes the blaze. ~~of a candle~~

3 A certain odor is said to be derived from a peculiar oil.

It is essential to the perspiration. In hard working people it is of a fetid nature. It is different in different ages & nations. Individuals - Dogs discover their masters by their Perspiration tho' it be blended with the perspiration of a thousand persons. I mentioned formerly a fact from Dr Cat of a man whose smell was so acute as to

It is much influenced by diet. The Brahmins in the East Indies who live wholly on vegetables, complain much of the fator of the breath & perspiration of the Europeans who live on animal food. — Even foxes derive a fator from the smallest portion of animal food. This occurred in Dr Roan's wife — in a cancer of her breast. Dr Young yellow fever and of others —

The smell in a Church in Greenland was insupportable to ~~an~~ Mr Cranz from the inhabitants feeding on rancid whale oil.

~~In a patient of mine imagined me that he had took a quantity of lb 2 of turpentine by mistake. Five weeks afterwards he distinctly perceived it in his perspiration when he came near the fire. This is an important fact.~~

distinguish a virgin from a married woman only by her perspiration?

After the water & volatile salt is discharged from the pores, a glutinous matter remains on the skin, which has been mistaken for oil, and has been derived from certain glands called sebaceous. but no such glands are to be found on the skin, the residuum of the perspirable matter is abundantly sufficient to ~~[illegible]~~ preserve a due softness in the skin. ___ This matter should be often washed of in summer. The Ancients did it with reality not soap. Is sweat ~~a different~~ discharged from a different set of vessels from the perspirable matter? I answer no. It arises only from a relaxation & dilatation of the arteries which

[Fœtid sweats like breath - distressing! - see Com: plaubarty
It shows the length of time in which the
Seeds of a disease may float in the System
without exciting the disease. Miasmata
Jacksonians from days, 20 days, - I believe much
longer. Saliva of a rabid Animal many
months.]

[V in many different forms. They are 1 Sweet ~~putrid~~ ~~just insipid~~ as in the Diabetes. 2 Acid - Chaptal tells us of an Ammonia being formed by a patient washing his hands in a solution of potash. 3 Saline - as in hawsthaboss 4. putrid, or fœtid as in malign^t fevers. These fœtid sweats are conf^d chiefly to Arm pits - Feet. Sometimes induced by animal diet in persons infected with miasmata of yellow fever. 5 Cold. 6 Clammy - 7 yellow - after yellow fever - 8 bloody - these arise from great pain - a plant at the matches so stimulating as to induce them]

U In Italy it is found be 3/8 of all that is taken into the body. Mr Legrand & Mr Lavis^r confined a man in a silk bag varnished with elastic gum so as to be impenetra=ble by air & water, with an opening at the mouth. They found that he dis=charged 18 grains of pessys: matter in

~~discharges perspirable matter~~ This
sweat is varied by many causes.

6 What quantity of matter is discharged
from the body by perspiration in 24 hours?
I answer - ~~in 24 in health~~ more than is discharged
by ~~all the~~ Urine and stool. Great
pains have been taken to ascertain
this question.

But it will be difficult to do
this until all the circumstances which
influence it can be reduced to certain
laws. For it is different in different
ages, seasons & countries, - also in dif-
-ferent classes of people. Where a moderate
quantity of aliment and drinks are taken
in a day, it is generally in a
healthy person in England about 30 Ounces.

a minute, or a mean quantity of the Air is in a day.

6 ✓ Dr Pretty informs us - it is greater in 9 hours in bed, than in 15 out of bed ~~this is contradicted by Dr Porter's experiment. Hence the great advantage of lying in bed in hopes Dr Pretty meant farther by short only the beginning of Colds & fevers~~ hence advantage of lying a bedde & of weaned people sitting up.

4 It is greater after divided meals, than after two or three full meals in a day, hence the advantage of advising small & frequent meals to weakly people.

5 ✓ It is encreased much more by drinks than solid food.

7 It is greatest during Digestion.

2 It is different in summer & winter. ~~It is~~ much more is discharged in the former, ~~in the greatest quantity in summer~~ than in the latter season. ~~least of all is the least discharged in winter.~~

over to p: 705

It is different in the sleeping and waking states. — Double the quantity is discharged in 9 hours in the sleeping ~~the~~ above the same time in the waking state.

3 ~~Insensible~~ more is discharged between the 5th to the 8th hour after sleeping, ~~Lifetime as much is discharged~~ than between sleeping & the 5th hour.

4 Motion - Rest - passions of the mind - the gratification ~~exercise~~ of the venereal ~~pa~~ appetite - different drinks & aliments all influence the quantity of the matter which is discharged by perspiration.

~~& women perspire less than men~~

1 It is different in different ~~people~~ ages, seasons and countries, also in different classes of people.

2 It is different in different seasons. more is discharged in summer than in winter.

3 more is discharged between the 5th and 8th hours after sleeping, than between supping, and the 5th hour.

4 It is greater after divided meals, than after two or three meals in a day — hence I shall say hereafter the advantage of advising small & frequent meals to patients when we wish to ~~encr~~ promote this discharge from their bodies. —

5 It is increased more by fluid, than by solid ~~food~~ food; hence the advantage of advising fluid aliment in acute diseases, and that which is solid in chronic diseases. the latter being generally accompanied with

debility, the diminution of the perspiration becomes an important indication in their cure.

6 It is less copious in women than in men, and hence one of the causes of their monthly disease. —

7 Dr Pretty says it is greater in 9 hours in bed, than it is in 15 out of bed. This is probable, provided the person do not sleep; for in the waking state, the centrifugal direction of the nervous & arterial influence still continues, while the recumbent posture of the body favours the discharge of the perspirable matter. This fact is of great application in medicine. It shows the necessity of lying down, or retiring to bed in febrile diseases, ~~and of one~~ In this way I shall say hereafter the famous Player Macklin passed a life of 96 years without ever experiencing a

2

single fit of sickness. The fact suggests to me further the advantage of advising patients in whom a copious perspiration would be hurtful, to avoid lying down as much as possible ~~as~~ in the day time, and to pass no time in bed, which is not passed in sleep. Sanctorius says we perspire twice as much in sleep as in the waking state, but Dr Gorter has contradicted this ~~fa~~ assertion by an experiment made on purpose to decide it. I said when treating upon sleep that all the ~~functions to the~~ vessels that are employed in excretion are less active in the sleeping, than in the waking state. This is evident in the bowels, and bladder. ~~to~~ why should it not be ~~so~~ so in the vessels which discharge the perspiration?

V all this variety in the discharges of
excrementitious matter from the body
may easily be accounted for by recol=
=lecting that the vessels which discharge
it are under the influence of stimuli,
and of course their discharges as to
quantity and quality will be affected
by every thing that induces a healthy
action in ~~them~~ those vessels.

It is possible heat has been mistaken for perspiration, ~~and that~~ by Sanctorius, and that his experiment was made, ~~after~~ after steps of a more than ordinary morbid nature. —

8 It is increased by exercise, and lessened by rest.

9 It is increased by certain aliments & drinks & lessened by others.

10 It is increased by ~~certain~~ the stimulating vapours & lessened by ~~others~~ such as are of a sedative nature. The former increases it more than exercise.

12 It is ~~increased~~ by the gratification of the venereal appetite.

13 It is most copious in the hands & feet and under the arms, from their being exposed to the most ~~of~~ exercise and friction. ✓

Lemoni an Italian physician
describes a sweet which resembled
in its smell & taste

14 There have been many disputes concerning the quantity of perspiration discharged in a given time. ~~[illegible]~~ It varies I have said in different climates. ~~[illegible]~~ In Italy it is about $\frac{1}{50}$ according to Sanctorius — In England $\frac{1}{33}$ according to Dr Heil, and in the United States $\frac{1}{41}$ according to the experiments of Dr Klapp in 24 hours — [60 oz to body] ~~[illegible]~~ Mr Cornishanks experiments place it at $\frac{1}{84}$ when the body is at rest, and $\frac{1}{47}$ when it is in exercise. But I have said there was a fallacy in his experiments. He applied cold water to the outside of the bottle in which he placed his hand which precipitated the moisture of the air in the bottle, with

the perspiration of his hand, and thus added much to its quantity. It was by obviating this error that Dr Klapp's experiment ~~accorded~~ accorded so nearly with Sanctorius, in Italy and Dr Keill's in England. Dr Klapp found the perspiration from the lungs to be of the same quality with that from the ~~lungs~~ pores.

There is in the healthy state of the body, a constant harmony between the vessels which discharge the perspirable matter, and the kidneys & bowels. When the former are suddenly obstructed, the perspirable matter ~~is thrown~~ is discharged by Urine or stool. It is only when the ~~[illegible]~~ solids are in a state of ~~[illegible]~~ debility that this matter is retained in the system, in which case it produces perhaps congestion, and fever. Sometimes ~~the [illegible]~~ it

4

produces Catarrh when it insinuates its way to the kidneys or bowels. In winter this Catarrh is much less dangerous than in summer, in consequence of the increased action of heat upon the skin imparting a more acrid nature to it - hence summer colds are so often fol=
=lowed by pulmonary consumption. In some instances the perspiration is thrown when neglected as somuch more obstinate than winter colds, upon the Schneiderian membrane where it produces what is called Coryza when the eyes are always in a state of predisp: to debility. In Egypt the perspirable matter is thrown upon them where it produces what Dr. Ascherini calls a Coryza of the eyes." When the perspirable matter stagnates upon the skin it produces

has been called the jail, Ship, camp, and hospital fever all which mean but one & the same disease. —

The perspiration is liable to be changed by disease in the following ways: 1 It ~~is said~~ becomes acid. Chapell tells us a true ammonia was formed by a patients washing his hands in a solution of pot ash. 2 It is sabine as in mapes & day labourers. 3 It is clammy as in ~~the fever of death~~ dying persons. 4 It is yellow - as after the crisis of the yellow fever. I once met with a case in which yellow sweats continued a whole year after the patients' recovery. 5 It is fœtid, not only in malignant fevers but in some chronic diseases. I have lately been consulted by letter on a case of the latter kind. Dry remedies were gentle purges,

✓ 6 Lanzoni an Italian physician
describes a sweet white resembled
wine ~~in~~ in smell & taste.

and a Vegetable diet. V. Lastly, It is
<u>bloody</u>. This is induced by great decay
of body and mind. Cases of this kind
are to be met with in many of our
medical books. They establish the truth
of the history of our forefathers fashion in
the garden, by showing that it is agreeable
to nature, and that it has accrued from the
same cause in other people.

where the drinks and diet have been moderate, the quantity discharged by perspiration in 24 hours in a temperature of about 70° is said to be about ℥50 in Italy according to Sanctorius — about ℥33 in England according to Dr Keill — and from the experiments of Dr Klapp ℥40 in the United States. You see I reject the extravagant quantity of ℥87, when at rest & ℥76 after exercise mentioned by Mr Cuik-thanks. In collecting the perspiration of his hand, multiplied by 69 in a bottle, he applied cold water to the outside of the bottle which precipitated the moisture of the air within the bottle with the perspiration of his hand, and thus added much to its quantity. It was by obviating this error, that Dr

The whole of what has been said may be easily un-
-derstood by recollecting that the per-
-spirable vessels, like every other
eliminated part of the body are
under the influence of stimuli, and
of course their discharges will be
affected as to quantity & quality by
every thing that induces a healthy
action, ~~or that induces in~~ direct or
indirect debility in the perspirable
vessels. —

There is in the healthy state of
the body, a constant harmony between
~~this action~~ these vessels & the kidneys & bowels.
~~& lungs~~ when they are suddenly ob-
-structed, the perspirable matter passes

Klapp's experiment accorded to nearly with Santorius; in Italy & Dr Keil's in England. Dr K. found the perspir. in 24 hours the lungs in 24 hours to be ~~[illegible]~~ 3 lbs. & the qualities of the same as from the pores. V Sometimes it does harm by its specific, or acid qualities. In

In winter the obstructed perspiration is thrown upon the lungs – in the summer – upon the bowels. This I remarked formerly in speaking of the effects of season upon the sympathies of different parts of the body. When it stagnates a long while on the skin it produces jail – or hospital fever.

The perspiration is liable to be changed by disease in the following ways. It is acid. Chaptal tells us an amaurosis was formed by a patient washing his hands in a solution of pot ash. 2 saline as in persons who work hard. 3 clammy. 4 yellow. 5 fatid not only in malignant fevers, but in chronic as in Catherts case. & 6 bloody. This is induced by great agony of body and mind, ~~the Bloody~~ record of which are to be met with in ~~several of our~~ medical books. ~~& they prove the~~ They establish the truth of the history of our saviour's

off by Urine or Stool. It is only when the system is debilitated, that this matter is retained in the system. ~~It is not a law supposed the cause of colds and fevers, but the~~ Disease from it is ~~It is the~~ the effects of ~~general~~ debility first induced upon the body. ~~It~~ increases fevers by producing ~~plethora~~ fulness & congestion, but ~~in a low~~ without previous debility, it ~~on a disease~~ induced upon the solids, I believe it can in no case produce a ~~disease~~ fever; so happily is the balance kept up between the perspirable pipes, the kidneys & the bowels. But I am insensibly encroaching upon the business of Pathology.

V By extirpation is understood the completion of ~~the~~ animalization.

= passion in the gender, by showing that it is agreeable to ~~the~~ nature, and that it occurs from the same causes in other people.

⊙ The former opinion was held by Buffon, Wanton, and several other Physiologists. It was likewise taught by Dr. Cullen.

# of Nutrition V

There are two opinions upon the subject of the nourishment of the body, the ~~fo~~ one is, that it is carried on by means of the Nerves — the other that it is carried on by means of the Arteries.

~~I formerly~~ once believed & taught the former after my master Dr Cullen, but I ~~now~~ have long ago publickly rejected it, and ~~be~~ am now fully satisfied with Dr Monroe that it is carried on wholly by the Arteries. The principal Argument ~~upon~~ by which I maintained ~~had the I taught the former.~~ ~~Dr Cullen's. This~~ ~~discovered lately found~~ His principal Argument in favor of it was founded upon a mistake viz that the brain & nerves were molded in a fœtus before the ~~bones~~ arteries. From

~~in one particular from the Observa-~~
~~-tions of Dr Harvey. He says he discovered~~
~~red blood in a Chick in ovo before he~~
~~saw the Sign of heart or blood vessels.~~

the Observations of Dr Haller it appears that this is not the case. In an Egg 38 hours after incubation the Dr. perceived the heart first projecting from the breast, — in 45 hours after incubation he perceived its Auricle-Ventricle & aorta — & their motion — & the blood beginning to grow red. The head was not distinguishable ~~for~~ till the 41 hour — the eyes not till the 51, — at the 120th hour the brain was watery, ~~&~~ at the 168th hour it looked like Mucus — & at 131 hour spontaneous motion of the fœtus was first observed. — ~~This leaves it [illegible]~~

From this detail of facts, it is evident that the brain & nerves ~~are~~ are not evolved before the heart

It is remarkable that no motion is perceived in the ~~to~~ heart or blood vessels Untill after the formation of red blood. This is proved by Dr Harvey's — from which it would seem probable that the stimulus of blood ~~gave~~ gave the first impulse ~~to it & the~~ to animal life. — Perhaps ~~the~~ the order of the origin of life may be — 1 the blood acting on the Arteries — 2 by the heart & arteries acting upon ~~of~~ the brain — and 3 by the brain afterwards reacting on the heart — arteries — and blood — and afterwards each of them acting reciprocally and mutually ~~acting~~ upon each other. In this view of animal life, you still see that it is an effect, and that the heart & Brain which have been supposed to be the fountains of life or to be endowed with a vital principle are the reverse of this. They are moved

& Arteries — Dr Monroe supposes that they exist coevally with each other — If I were obliged to decide upon their being coequal or prior to the brain or nerves, I would rather suppose they were prior to them, — at least in their motions. — It is certain that the Arteries are strong conductors of the Stimuli which produce life, — hence we find they move in sleep, — in old age, — and in many diseases in which the brain & nerves are quiescent. and lastly they are generally the surface upon which stimuli produce their last action in the extinction of life.

only from without first by the stimulus, of blood and afterwards by all the external stimuli that were formerly mentd.

— From this view of the system Dr Valli, I remarked ~~formerly~~ in the lectures on A. life, has ingeniously called the extremities of the nerves this origin, and the brain this termination.

— I cannot helps adopting the idea, as far as it relates to the commence=ment, & preservation of animal life. —